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THE disasters in theatres which we have lately had to record are insignificant in comparison with the terrible burning of the Brooklyn Theatre, of which news came just after our last number had gone to press. Three days after, a theatre was burned in Albany; in the morning, fortunately, when it was empty. The controllable causes in each of the fatal disasters were the same, — criminal recklessness of those who built the theatres, culpable neglect of the cities where they were to provide or enforce proper rules for their planning and construction. The faults of the Brooklyn Theatre are evident enough from the story of the burning. The fire caught among the flies from a border light in the rear of the stage; it could not be checked, and in five minutes the stage was in a blaze. The bursting open of large doors in the rear of the stage let in a blast of air, which drove the flames out through the proscenium arch into the auditorium: the ceiling took fire, and in a quarter of an hour the roof had burned through, fell, and carried with it the galleries and the floor into the cellar. Meanwhile the spectators below got safely out of the house; those in the upper gallery, finding that they got out very slowly, became mad with terror, and fought like wild beasts, those who were behind beating down those in front, and blocking the way till escape was impossible. There were four hundred people in this gallery; and when the ruins were cleared it was found that about three hundred of them — nearly a third of the whole audience — had perished.

HOWEVER careful the administration of the theatre may have been, it is clear that it was as badly provided against fire as it well could have been. A carpenter who tried to beat out the fire when it first caught testified that if he had had a hose he could have extinguished it; but there was none. One of the managers testified that there was a hose; but the provision could not have been very ample if the employees knew nothing about it. There is no pretence that there were any stand-pipes, without which a hose on the stage would be of very little use. The border lights were fitted with rubber connections, and one of these connections had taken fire only a few days before. The proscenium, and the partition between the stage and auditorium, were of wood; the loft above the auditorium was stored with inflammable rubbish; so that the whole burned like touch-wood. According to the account of one of the actors, it was barely five minutes after the alarm was given that the fire burst through the roof.

THE architect of the theatre, Mr. Jackson, said, according to the newspaper report of his testimony, that the theatre was as well provided with outlets as any he knew. If the newspaper report is right, it leads one to wonder what theatres Mr. Jackson did know, and to infer that his knowledge was not enough to justify him in undertaking to build a theatre. The position of the theatre was more favorable to security than is common. It had a frontage of seventy feet on Johnson Street, a side of one hundred and twenty feet on Flood's Alley, and a passage of twenty feet wide across the rear of the lot to Washington Street, which is parallel to Flood's Alley. The building seems to have been cleverly planned from the manager's point of view, that is, so as to admit the spectators from the principal street, and to make the most of the seating-room; but very little care was shown for the safety of the audience. In order to get the principal entrance on Washington Street, apparently, the stage was put in the front on Johnson Street, and the auditorium in the rear, where it opened upon the Washington-street passage or lobby, which crossed from the alley to the street. There were side doors from the auditorium upon Flood's Alley: they were broken open, and the floor was easily cleared. There was also a door from the lobby to the alley, under the stairs from the dress-circle. These stairs are said to have been seven feet wide, and at the bottom faced the Washington-street entrance, so that by the aid of policemen and doorkeepers the people descending them were extricated without much loss of life. There was a fire-exit from the dress-circle to Flood's Alley; whether it was availed of or not, we do not know: if it was next the stage, as we should infer it must have been, it was doubtless impassable. There is, however, no evidence that the dress-circle was not emptied. But the only way of escape for the mass of people in the upper tier was by a single door, and a single stairway seven feet wide, necessarily tortuous, leading out like the other main outlet to the more remote or Washington-street entrance. This stairway, it is said, had no hand-rail, — an unpardonable omission. Here was the occasion of the great loss of life. The landings were quickly blocked by a heap of the fallen spectators, thrown down by the struggle of those who were behind them; and the stairs became at once impassable, though a few persons escaped by trampling on those who had fallen. It has been said too that the gallery and stairs fell in a very few minutes, probably because their supports were burnt away.

THE loss of life seems to be clearly attributable to the way in which the exits were planned, and to the combustible character of the building. We notice that Mr. Morse, an architect who had been concerned with repairs to the theatre, when questioned in his examination why it took but four minutes for the fire to reach the gallery, said that it was because of the amount of inflammable material on the stage, and the blast of wind from the rear. He did not say that the proscenium and the front wall of the stage were as inflammable as the rest; nor whether this partition was carried up above the ceiling of the auditorium to the roof, which, being only a screen, it probably was not; nor that the space above the ceiling was a store-room for inflammable stuff. We believe that the only safeguard against such disasters is in fixing by penal statute a rigid responsibility, so that not only a civil but a criminal action shall lie against those who build places of amusement recklessly; and against their architects, unless these can show that they were absolutely constrained by their clients. It is quite possible that in the Brooklyn case the faulty dispositions and construction were enforced upon the architect; but in spite of his plea of general ignorance, unless he can show that they were forced upon him, he cannot be held guiltless. We know one architect who, having built a theatre, was compelled against his energetic protests, to let his exit doors swing inward; and another who had arranged for a sprinkler over his stage, only to have it suppressed at the last moment. We may well repeat what we said a short time ago (No. 48) in

speaking of the accidents in the California theatres, — that where there is no responsibility there is no security. It is not a question of punishment to be inflicted for a wrong done. The wrong would be impossible to weigh, and the punishment to adjust. It concerns simply the duty of society to protect its members against injury through neglect or incapacity of those to whom their lives are intrusted. Wherever responsibility is found to rest, there security is to be exacted. The application of the penalty for manslaughter would make incapable persons shy of undertaking difficult buildings, or proprietors of interfering to defeat their architects' precautions, or architects of trusting to any thing but carefully considered plans and thorough construction. The remedy might be severe, but it would not have to be applied often.

FIVE months ago, a committee of which MM. Duc, Viollet-le-Duc, and Léonce Reynaud were members, was appointed by the French Government to consider what should be done with the ruins of the old palace of the Tuileries, destroyed by the Commune. The committee has decided, it is said, that the palace shall be rebuilt just as it stood, as an archæological souvenir, we take it. The wings which have already been pulled down, they would have renewed; and the central pavilion, of which the ruined walls still stand, is to be carefully restored. Some of the work of restoration has already been begun under the direction of M. Reynaud. The outer facing of cut stone from twelve to twenty inches thick has been preserved, and a new backing of brickwork applied to it. But the facing itself has suffered more or less from the fire, and M. Reynaud has devised a plan for injecting a grouting of Roman cement into the cracks of it. We are not told whether the experiment has been tried yet or not. The restored pavilion would be of great historical interest; but as we remember it, the marks of fire which it bears could never be effaced. But it is a question how much endurance would be left in a calcareous stone that has passed through such a heat. The *Revue Générale de l'Architecture* reminds us that the parts of the walls of the *Hôtel de Ville* which stood, and of which it was supposed that much could be preserved, had to be all taken down one after the other. Of the general scheme of restoration the *Revue* says, wisely we should think, "To reconstruct the monument we have all known, a palace of mixed origin, a work which had been at once mutilated and magnified enormously and tastelessly, would be in our opinion a senseless act." It suggests the restoration of the work of Philibert de l'Orme, for restoring which in its primitive form it thinks there are data enough, but is scandalized at the thought of repeating the "scars and ignoble ulcers" with which it has been overlaid. The work of De l'Orme, it will be remembered, included the central pavilion and the adjoining galleries, of all of which, however, the upper stories were added by later architects.

THE competition for the National Memorial to Lord Byron, the conditions of which were mentioned in the *American Architect* for July 15, seems to have been rather more of a *fiasco* than might have been expected from the conditions that were laid down for it. It was understood that three referees were to be appointed by the committee, and three by the competitors; but the representation of the competitors proved to be impossible, since the designs came from various countries. A definite scale of two feet for the figure of Lord Byron was stated in the programme, yet competitors who chose to depart from the printed conditions were not rebuked by having their designs rejected in the first place, but were admitted to compete with those who had adhered to them. It is reported, in fact, that one of the six selected designs was chosen for the very reason that it was executed at double the scale of the majority of the designs submitted, and was therefore more full in detail and expression. Those who chose to neglect the pedestal that was called for were not disqualified from competing; nor were those whose pedestals were simply drawn or sketched on paper, and not modelled. More than forty designs were submitted, all of which were rejected; but six of them were selected as being the most acceptable to the committee, the authors of which were especially invited to take part in the second competition; an invitation which is perfectly meaningless, because the second competition is an open one, and so the five sculptors — two of the designs were by the same hand — are not to compete with one another, but with their original rivals, and with whomsoever chooses to take part in it after having benefited by the study of the rejected designs.

THE SECURITY OF THEATRES.

THE horrible disaster at the Brooklyn Theatre gives a startling force to the lessons taught by the accidents in the two Californian theatres which we chronicled a few weeks ago. People will for the present remember that theatres are the most inflammable of public buildings, that the audiences are more closely packed in them than in any others, and that their way of escape is beset with more difficulties. There are many precautions to be taken for extinguishing fires if they occur, and for preventing the spread of them through the buildings; but the first problem of all to be considered is the disposal of the audience, which if there is fire or if there is danger must be got out of the way, and which in trying to get out of the way is liable to do itself, or to suffer, terrible harm. We shall speak here, therefore, of certain considerations which we think ought to be primarily regarded in the general planning of theatres, reserving what we have to say concerning special precautions against fire for another article.

Some of the newspapers have urged the people to take their security into their own hands, and compel builders of theatres to build them properly, by refusing to attend any that are dangerous. It is pretty safe, however, to say that appeals to the caution of theatre-goers will be fruitless. When people are bent on amusement they are not thinking of precautions. They go to theatres in their careless moods, and the most careless people will, on the whole, go most. If the performances are attractive the people will surely go to them, whether the building be safe or not. But since a large theatre will hold nightly the population of a considerable town, its peril is too serious for the community in its law-making to neglect. The burden of care which the theatre-goers will not bear, the municipalities must take up. Theatre audiences must be regarded as irresponsible wards or as children, whom their cities are obliged to protect, who will not keep out of danger, and who when they are in danger will behave as badly and do themselves as much injury as possible. Their protection can be assured only by enforcing very stringent rules concerning the arrangement, construction, and care of theatres.

For deliverance of those who are in theatres, — and mainly of the audience, who not only are the great majority, but to whose bad behavior most of the injury that is done is due, — the exits are the main thing. And here it should be said that a great part of the danger to the community comes from the improper situations in which theatres are built, the unsuitable and insufficient sites that are provided for them. This is a point where municipal control is essential. First of all, the building of theatres on such lots as are commonly used should be absolutely forbidden. It is common to choose lots that have but little frontage, because managers want their entrances on principal thoroughfares, and these broad frontages are very costly, being in demand for business purposes. But for safety's sake, the outer walls of a theatre should be all fronts, that they may be all entrances; that is, they should

stand free on all sides. It is of no use to rely upon the amplitude of one or two principal entrances, and to compute the time in which an orderly audience will get out through them. We are to remember that the fatal things are panics; that fires are dangerous mainly because of the panics they cause; that where there is apparent danger there will surely be panics, and often where there is none; and that in panics men destroy each other like mad cattle. This is the bitter and hopeless aspect of the case, but it must be met. The only safeguard is in subdividing the audience as much as possible, and leading them, without the use of their wits, which they will have lost, directly to the nearest points in the exterior of the building, and there discharging them into the open air. In some European cities, theatres are required to be isolated on all sides. This is desirable; but at least they ought always to stand free on three sides, only the back of the stage being covered by other buildings, so that all sides of the auditorium should be directly connected with the streets. The Academy of Music in Philadelphia, and Niblo's in New York, are examples of what is exceptional in the situations of American theatres, but what ought to be the rule. This makes theatre-sites more expensive, of course: if it should drive them to the secondary streets, we do not know that the public would suffer any special inconvenience by it. For a like reason the auditorium floor should never be allowed to be more than a very few steps above the street level. It is hard enough to get people down from the upper galleries, at the best; and to add to the difficulties by giving everybody in the house one or two extra staircases to descend, is a wanton courting of danger. Besides all this, there is the additional hazard from fires or other casualties that may occur in the rooms below, — a hazard which the most careful fireproofing of floors will only partially cover. Another point to be insisted on is that the number of galleries or tiers allowed in each theatre shall be graduated according to the capacity of the site, since upon this depends the possibility of providing safe communications and exits enough for the spectators. In Boston, where we write, one of the oldest and most successful theatres is decidedly unsafe, because its auditorium is remote from the streets on which its entrances open, and its floor is up two flights of stairs. At least one other is insecure, because its sole entrance for both audience and actors is in its only street front; a third has entrances on two streets, but its secondary entrance is tortuous and obscure; only one has a reasonable sufficiency of exits both in front and rear. In New York only three theatres are said to be really well provided with outlets.

The clearing of the house, if there is sufficient communication with the street, is a question of subdividing the audience as much as possible, and leading the different sections as directly as may be, and without crossing or interference, to their separate outlets. To clear the floor is a comparatively easy matter. The passages between the seats should widen as they approach the doors; and there ought to be three of them, — one in the centre, leading to doors in the front of the theatre, and two lateral ones leading directly to side doors. The use of chairs in the aisles should of course be peremptorily forbidden. The dispersing of the spectators in the upper parts of the house is more difficult; their immediate danger is greater, and the distance they have to traverse is longer. The higher and more remote their places, the more ways of escape should be open to them; and as they advance towards the doors they should, if possible, be further subdivided and distributed. The very reverse of this is usually the case, and is, in fact, often almost compelled by the character of the lots on which our theatres are built. The upper galleries have commonly the fewest and narrowest staircases; and, as the audiences descend, they are usually brought together at the doors instead of being dispersed. Nothing is more fatal than the impinging of one hurrying crowd against another, as was instanced in the accident at the Chinese theatre in San Francisco, where the whole disaster came from letting the crowd from the gallery fall upon those who were escaping from the floor.

The grand stairway leading to the first tier of boxes, or the balcony as it is customary to consider it in American theatres, being naturally placed in front of the box corridor, upon which there should be several outlets, may be made sufficient for most emergencies; but there should be access to rear staircases, of which we shall speak later. It should not be less than fourteen or fifteen feet wide. In this width seven persons can easily walk abreast; and if they take but sixty steps in a minute, in that time four hundred and twenty of them may pass any given point. This is a larger number than are seated in almost any first tier except in the largest American theatres, where in two or three cases there are five hundred seats and upwards.

The arrangement of stairs which we noticed in M. Garnier's new Opera, by which a single lower ramp, in ascending, branches upward into two from the landing, although it has many advantages in point of effect, is one that it is well for security's sake to avoid, since the two descending currents on the upper ramps meet face to face on the landing. A safer, though a much less elegant arrangement is, to have the stairs branch downwards so that the spectators divide as they descend; and this arrangement leaves room for a wide passage under the landing for those who come from the middle of the parquet. The American habit of seating the galleries compactly, instead of dividing them into boxes, increases their capacity greatly, and makes it unsafe to have as many tiers as is common in European theatres, where the capacity of each ranges commonly from one hundred and fifty to two hundred and fifty seats. If, for instance, in the great Italian theatres, which are not too safe as it is, the six or seven tiers were seated as in our theatres, they would be very dangerous places.

Since the second gallery is farther from the exits than the first, more care is necessary, in emptying it. There ought not to be less than two special staircases leading to it; and there are commonly convenient places for these in the corners opposite the haunches of the arc which marks the outline of the auditorium in plan, and which it is the almost universal custom to use for stairways. These stairs ought to be some ten feet wide, and to be enclosed in a brick well which should separate them from the rest of the building, and lead each to its own exit door.

In theatres which are large enough in area to make a third tier permissible, since the spectators in this tier are more exposed to danger than any others, there should be still more care taken to provide means of escape. There ought to be as many as four staircases of seven or eight feet wide, to divide the audience into so many descending currents, and to allow for the accidental cutting-off of some of them. There should be room in the plan of such a theatre for two of these staircases, for instance, in or near the front corners of the building, and adjoining the stairs we have suggested for the second tier, with which it is better that they should not communicate. Two others may be placed where it is always important that there should be stairs, — at the two extreme ends of the corridors, against the proscenium wall. These stairs will also serve the small number of persons who occupy the stage boxes, and should be accessible from the two lower tiers in case of emergency. All these stairs, again, require their separate exits, and their enclosing wells of brick. A most reprehensible custom, it seems to us, is that of packing many more people in the upper tier than in those below. The temptation to managers is doubtless great. It costs very little to provide for them; the space they occupy is wanted for nothing else: and so the galleries are extended far back in front of the stages; and here, close under the roof, in the very place where the flames are sure to strike

first, the most remote from help and escape, and commonly with less opportunity for dispersion than anywhere else in the house, it is common to crowd together twice as many spectators as in any other section of the theatre. Here is a point at which municipal interference is imperatively necessary; and it ought not to have needed the horrible example of the Brooklyn Theatre to direct attention to it. Managers will naturally take less pains for the accommodation of those who pay them less than other spectators; but it belongs to the law to do what may be done to put them on an equality as regards security.

Thus, we think, in every large theatre there ought to be not less than seven exits from different parts of the house; and this requires that it should stand practically clear from other buildings. The ways of escape should be increased, not diminished, as we mount from gallery to gallery. For one stairway to the first gallery, there should be two assigned to the second, and four to the third. More than three, as our American theatres are arranged, there ought not to be. For smaller theatres with fewer subdivisions, so many provisions are of course not necessary. The omission of the upper gallery, for instance, would do away with the need for two entrances and two stairways.

The number of outer doors and stairways that we have allowed for will naturally require that theatres shall be more expensively planned than they are, and that their sites shall be ampler and better chosen. It would call for a larger force of doorkeepers and ushers, though of course it is not necessary that all the exits should be used as entrances, while it is important that the audiences should always be accustomed to use them as exits. Any attempts to enforce such regulations will be very unpalatable to theatre proprietors and managers, and will be resisted by all the means in their power. It may be that our municipalities, aroused for the moment to the need of precaution, will yet not have the resolution to exact proper safeguards. Already one manager writes to the papers that there is more danger from people crowding in a wide passage than in a narrow one: by the same rule we may suppose that when once his audience gets into the open street, their escape is hopeless. People will claim the right to build theatres wherever they please and pretty much as they please, with only so much regard as they are compelled to show to the safety of their frequenters and their neighbors; and they will sniff at the more or less expensive precautions that public safety requires. Nevertheless we may expect that every winter three or four theatres will burn (more than forty have burned in the United States within the last ten years); and if by insisting on all the necessary precautions we can once in a generation shun such a horror as that of the Brooklyn Theatre, it is worth our while to insist.

CONCERNING QUEEN ANNE.

THE pretensions that are made for Queen Anne as an architectural style are very lofty. It is contended that it offers the solution of our architectural problem of how to combine the satisfaction and expression of all modern requirements with antique gracefulness. This is a high claim; and it behooves us to inquire what is the fruitful principle in Queen Anne that entitles it to supersede every thing distinctive that has been done in architecture in our generation. If it has any vitality, it must have a vital principle. The vital principle of the Gothic revival is now pretty well understood. It may be stated to be, that a building is an organism, of which the architecture is not an application for decorative purposes, but the expression of its functions and conditions. This principle is evidently independent of any particular set of forms; but it is adequate to meet with new forms, new exigencies of requirement and material. Already several forms are established in modern Gothic work which were never thought of, because they were never needed, by mediæval architects. This is solecism in archæology, but it is a sign of life in art.

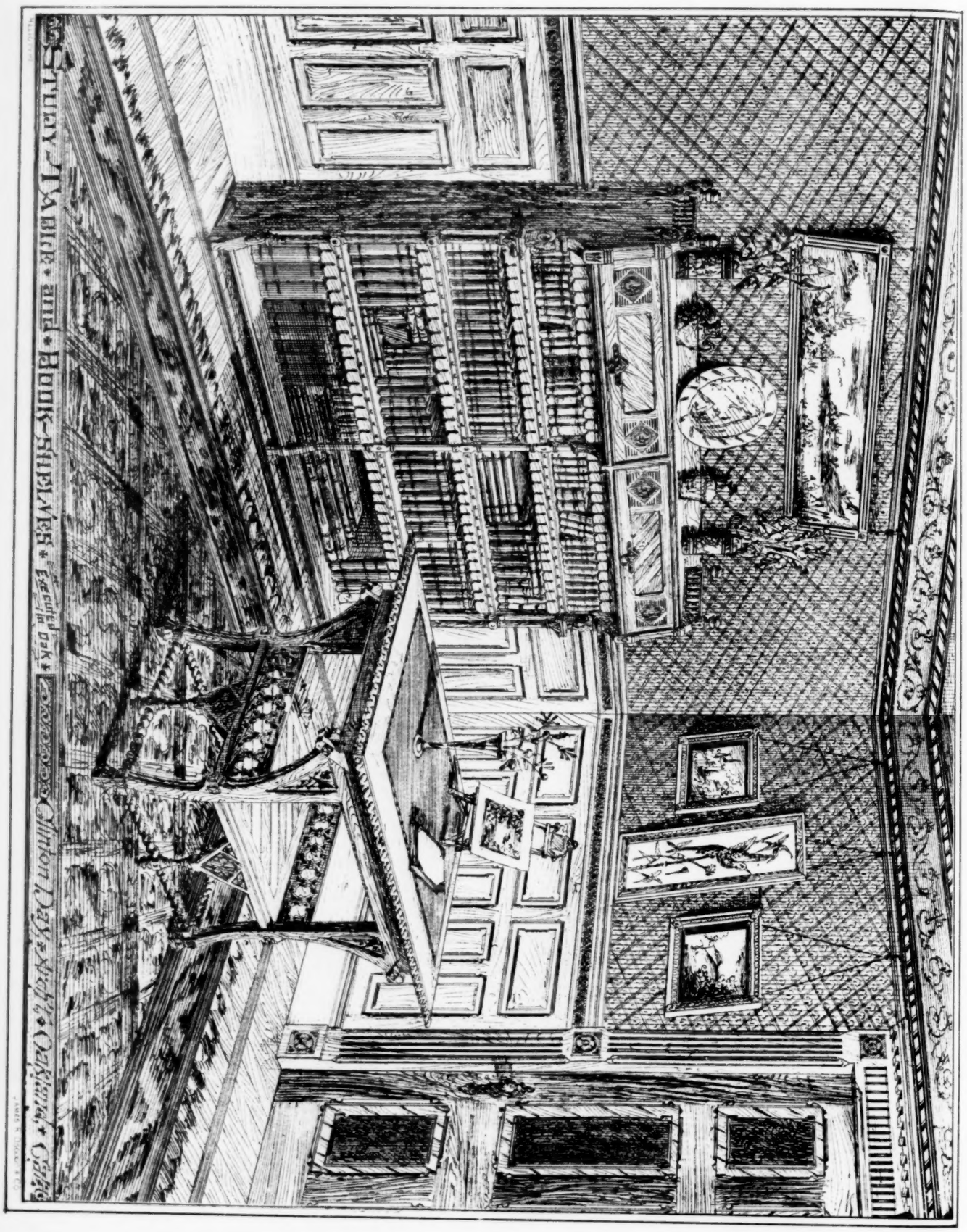
We seek in vain for any principle in Queen Anne of equal importance and fruitfulness with this. Neither in the writings nor in the works of the sect do we find either any explicit denial of this principle or any extension of it. If Queen Anne consists in the application of classic detail to buildings designed on Gothic principles, — say rather, on architectural principles, — it is entitled to be considered a style, if and in so far as the detail is consistent with and expressive of the construction to which it is applied. Where the decoration has no relation to the construction, as in stamping a wall with patterns in stucco, or in any system of merely mural decoration, it may be good or bad, but it has no claim to be considered an architectural style. Where it is inconsistent with the construction, it is anti-Gothic and anti-Greek, in fact, anti-architectural.

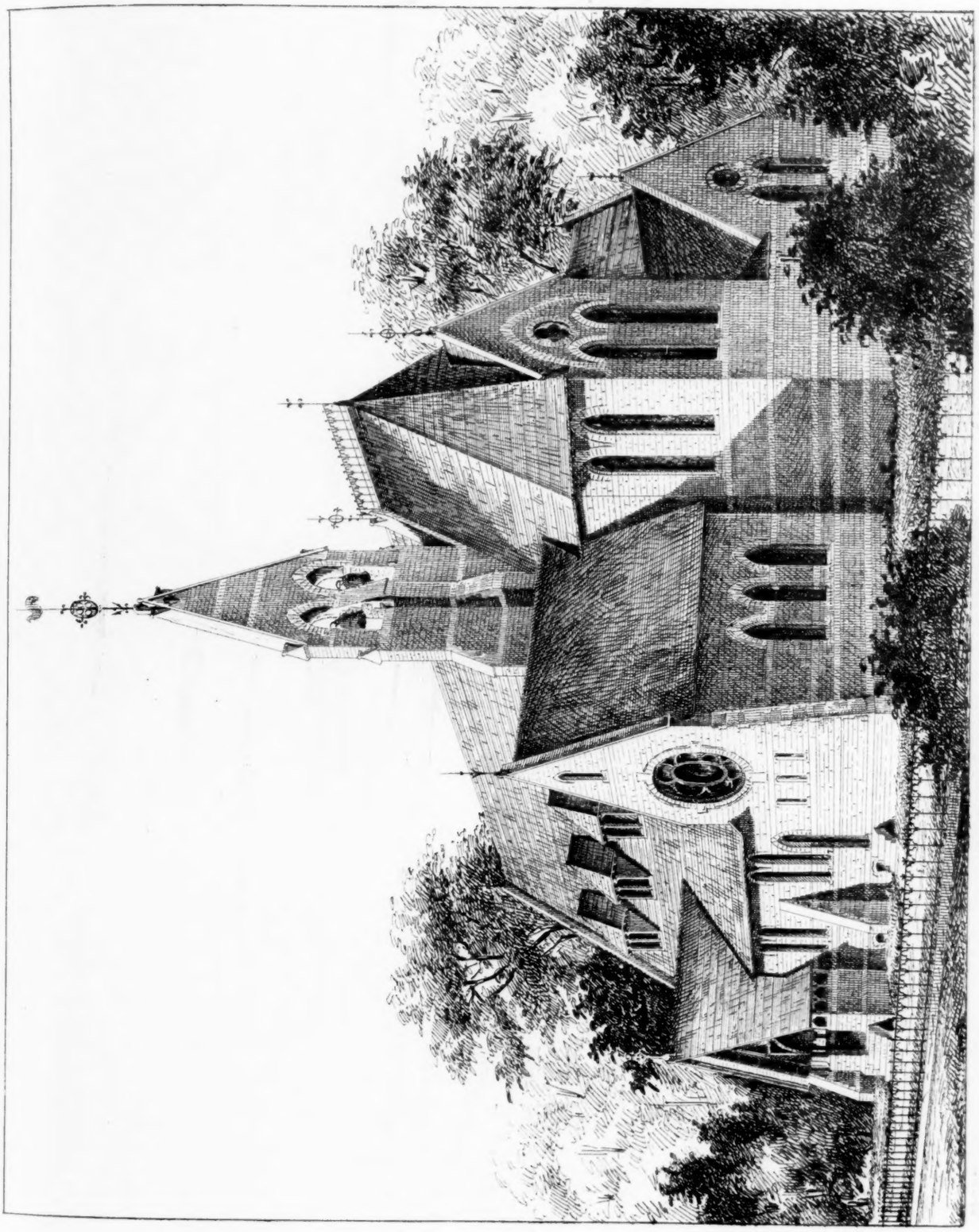
It must be remembered that a hundred details come no nearer making a style than one, unless they are combined into a consistent system, and informed by a creative principle. One looks in vain in the work of the Queen Anne architects, or of the writers of the sect, for such a system or such a principle. When one is suddenly told that he should reverence a stone ball on a gate-post as an æsthetic revelation he has a right to demand a reason, particularly when he has been seeing that object at intervals all his life with no feeling except that it was rather ugly and ridiculous, and that it derived a fictitious respectability from the mere fact of being old-fashioned. The preference for a triglyph over a trefoil is not revolutionary, even if it were novel; nor is the preference for a lintel over an arch. A building planned according to its requirements, and "designed from the ground plan," will, unless its requirements are exceedingly simple, be a hard building to fit classic detail to so as to make it "belong," and convert the result into an artistic whole. The most obvious way of doing this is to let construction take care of itself, and to confine the classic detail to portions of the building which have no special constructive significance; to sink panels in which to display sculpture, and to stamp blank walls in patterns. This is the tendency of Queen Anne. The result, if this tendency becomes established, must be to a system of decoration independent of, and unrelated to, the system of construction, to something, in other words, which, in the view of men who have done most to improve and develop architecture in our generation, is not architecture.

It may very likely be that the impossibility of combining classic detail organically, that is to say, architecturally, with free planning and free designs, had led the Queen Anne architects to provide as many rectangular spaces as possible in which to stow their classic detail, where, if it did not help the construction, it would at least not "bother" it. This may be partly the explanation why the lintel is so profusely used. If the lintel, devoid of the columns which have in past times dignified it, be the Beautiful, besides being the True and the Good, and, for the glazier, the Handy, the parallelogram, which a free classic architect of the Queen Anne school needs for his classic detail, must be a subtle and delightful polygon.

This proposition is a severe test of faith; but the more fervid of the disciples do not shrink from it. As well known an example of Queen Anne as there is in this country is the building of the English commissioners in Philadelphia. With several interesting points of design, not specially Queen Anne, it has this feature of what we may suppose to be distinctly Queen Anne: it is covered with a rectangular reticulation of beams filled with plaster in the walls and with glass in the windows. This is, in the first place, weak construction; for nobody would put up even a barn of these dimensions without some diagonal bracing in the framework. The beams are left unmoulded, not even a chamfer to break their lonely squareness. The effect of it is painful in the front, where there is difference enough of projection and form to give variety, where there is some variety, although an unmeaning variety, in the checkerwork itself, and where it is a subordinate detail. But upon the side, where unbroken flatness is decorated only by unbroken squareness, it is of an exquisite ugliness. One must be very far gone in a devotion to right lines to take this for a model of timber construction. In fact, it is not too much to say that American architects, those of them who count at all, have very little to learn from their contemporaries in England in regard to timber construction. They have more to give than to take in that way, as it would be a great disgrace to them if they had not. The tendencies of our rural architecture in wood are not likely to be changed by a contemplation of such buildings as this.

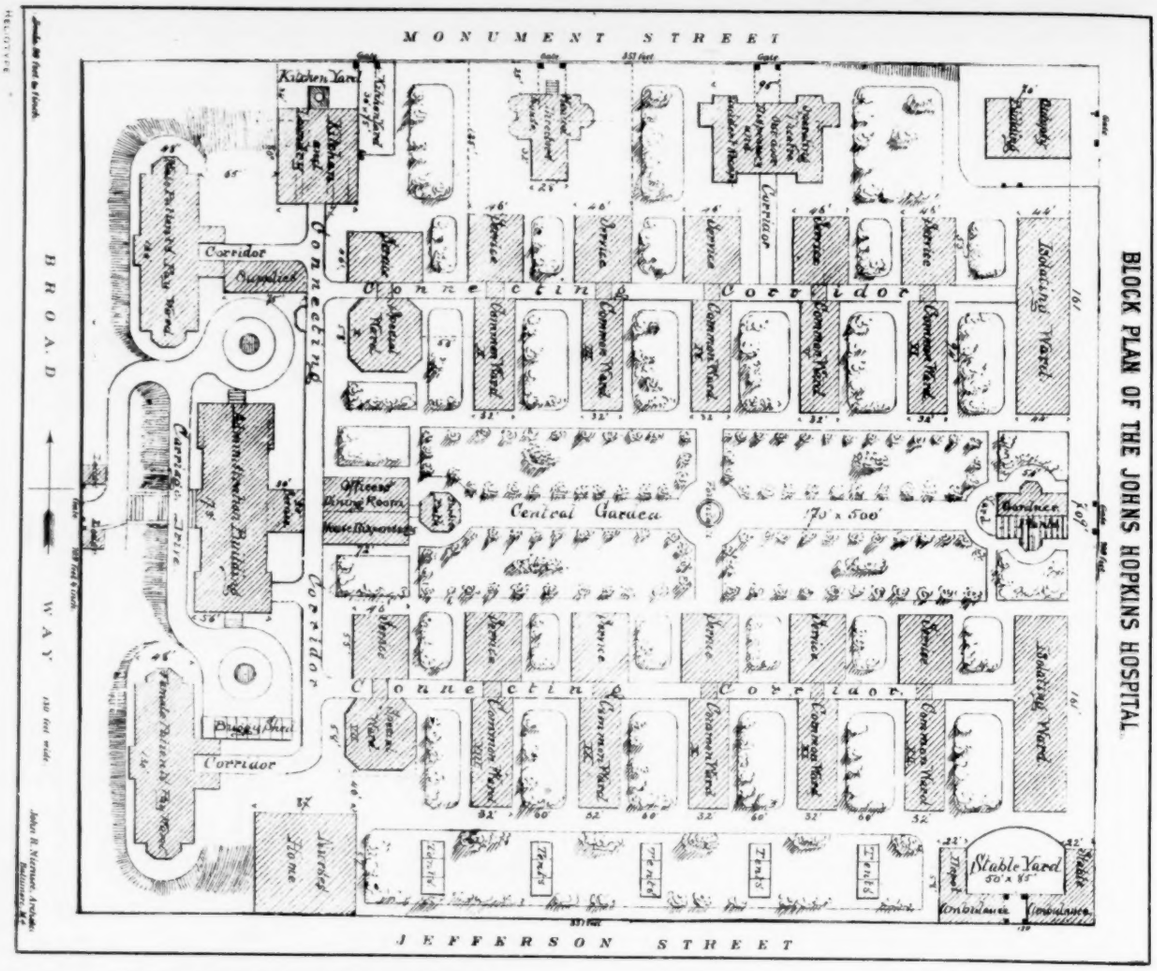
Mr. Norman Shaw is generally credited with the paternity of Queen Anne. There is no doubt about Mr. Shaw's cleverness; and it may be said that such of his work as is good, and is Queen Anne, is good not because of, but in spite of, its being Queen Anne. There can be no question about such designs as "Crag-


STUDY IN BLUE AND BROWN-SHELVES
Oak Painted Ebony Black & Gilt Cloth Cases Designed by Geo. E. Ashton

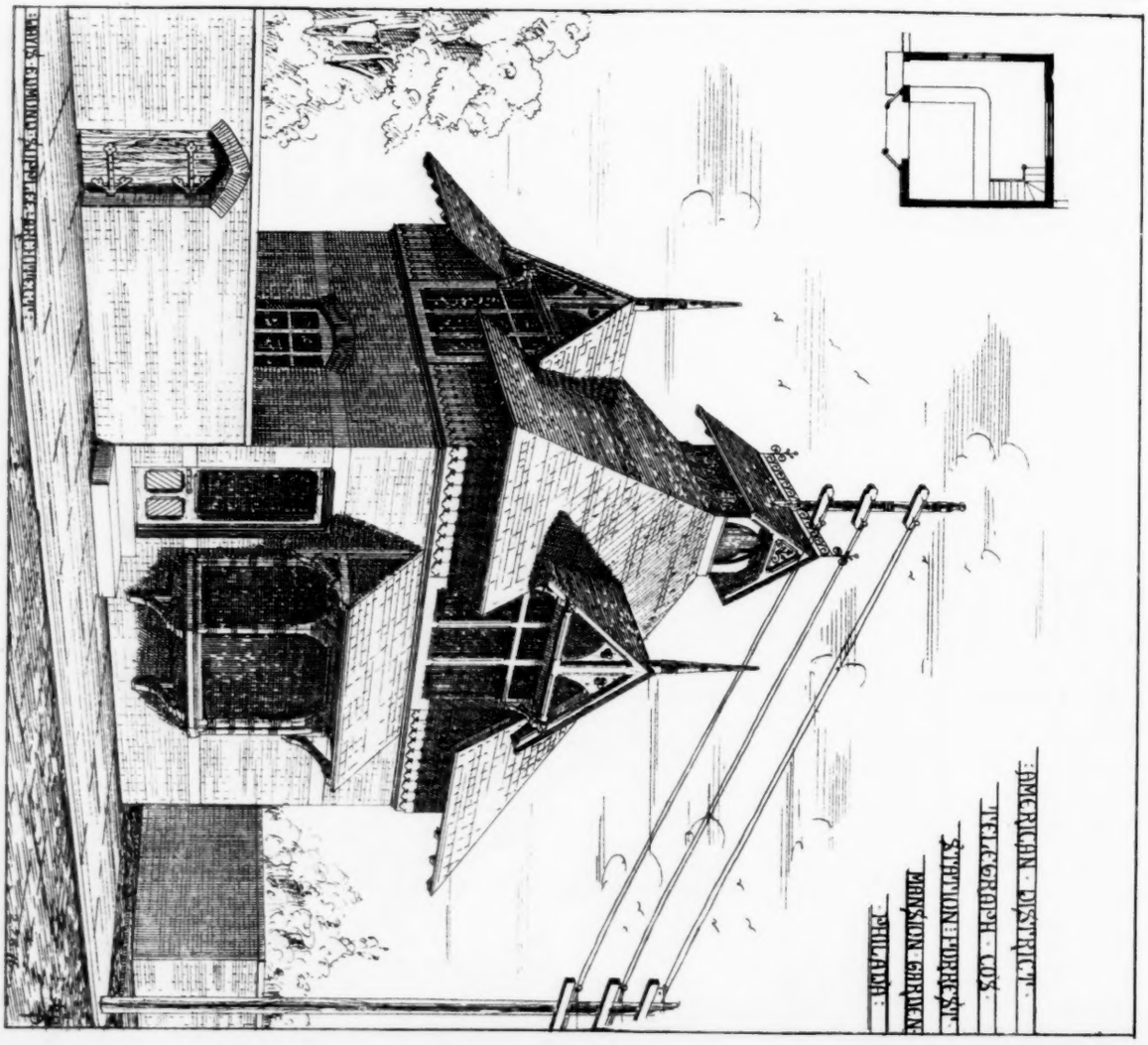


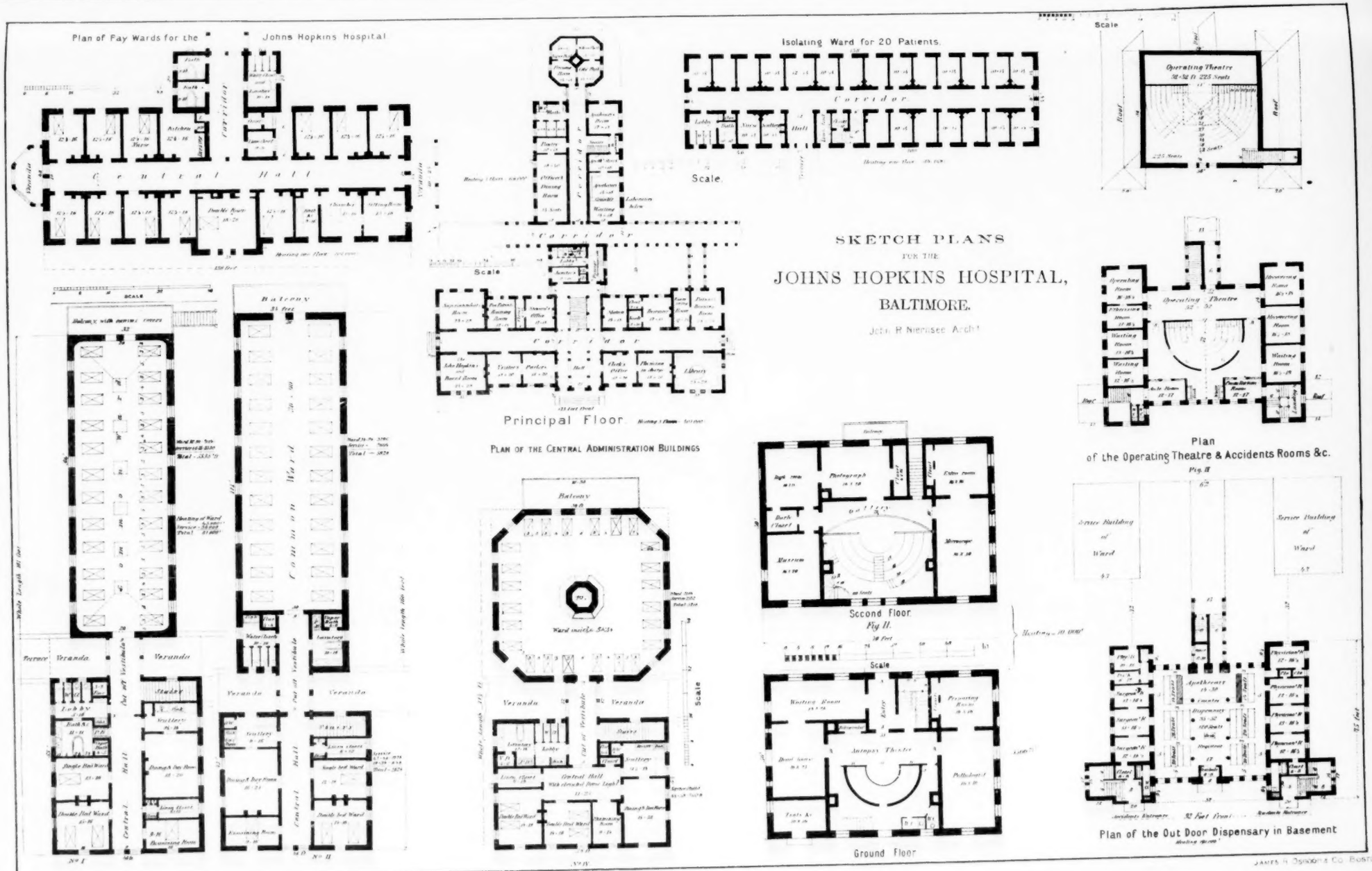
ST. GHOSTSEES CHURCH, HARTFORD, CONN.

H.H. RICHARDSON, ARCH'T.



BLOCK PLAN OF THE JOHNS HOPKINS HOSPITAL.





American Architect and Building News. Dec. 16. 1876.

side" and "The Wispers;" but, except that great and novel invention of the lintel, it would be hard to say what there is of Queen Anne about either. The New Zealand building in London is a vigorous performance; but the division of a brick building by powerful piers, on which its effectiveness depends, is not a patent issued by Queen Anne. Somebody has said of Wagner's music, that there were only two faults to be found with it, — one was Liszt, and the other was Berlioz. We need not mention any names; but the chief trouble with Mr. Shaw's Queen Anne occurs when it is done by other people. It is a pity to see a clever and reckless man bedevilling the weaker brethren of his profession in a whole nation, and obstructing a visible tendency towards a type which his talents might have helped to establish. Mr. Shaw's work is very lively and dashing; but the best of it shows, quite as distinctly as the worst, how far his qualities are beneath those which mark new departures in art, though they are quite sufficient to set a fashion, in the possession of a man who thinks that a good use to make of them. As to the worst of Mr. Shaw's work, that is distinctly Queen Anne, if Queen Anne means a following by architects with their eyes open of old fashions followed through many generations by men with their eyes shut. I have a photograph before me of Lowther Lodge (No. 568 of Lemere's series), at which I advise everybody who is inclined to regard Queen Anne as a promising art-form to look. Somebody has extolled Queen Anne as "combining the honesty of the Gothic with the refinement of the Renaissance." Perhaps this is the explanation of that dark saying. It is a brick wall with a coved cornice, apparently in plaster, and a steep roof. There are three long narrow segment-headed windows running through two stories, and a staircase running through three, and indicated outside by fourteen long windows on eight levels. So far we may suppose this is the "honesty of the Gothic." These windows are surmounted by segmental labels, with a protruding bundle of keybricks, apparently six or seven. The form of this ornament is exactly that of one of the cast-iron lintels to which the architectural iron-workers have accustomed us. Perhaps this is "the refinement of the Renaissance." From the back protrudes a wooden balcony, with no visible means of support; the beams which must in fact support it being carefully cased from sight. One would suppose this to be the refinement of the Renaissance too, if it were not so abominably ugly. The single pronounced arch form of the building is in the wooden dormers, where the mouldings of the gable return to form the springing of the wooden round arches which are moulded and decorated with a protruding keywood. If this dormer is an art type, we have only to revert for two generations; for there are several miles of dormers exactly like it in the older streets of New York alone, and they were done, not by ambitious architects, bent upon revolution, but by apathetic carpenters bent only upon doing what they had always seen done. All the woodwork of Lowther Lodge is painted a dead white, and the whole aspect of it impresses the beholder with a belief that hideous is a mild and feeble sort of adjective.

And yet superlatives are never safe. Here is 474 Fleet Street, a warehouse by T. E. Collcutt, which looks like "high Queen Anne," and makes us doubt whether Lowther Lodge is not a dignified building. Three visible stories high, besides the roof story, three windows wide, heavy sashes, the upper fixed, the lower swinging, the jambs of brick, and the window coverings of flat brick arches. So far as commonplace an object as any "honest bricklayer" could produce. Behold how it becomes a work of architectural art! The front, except the window-framing, is covered with stucco, stamped into patterns which have no relations with the lines of the building. If this is architecture, a paperhanger can convert a whole square into a monument of art in a week. And yet even Mr. T. E. Collcutt has capabilities, or glimmerings of capability. His dormers, crowned with hips, are not arches of white pine, but straightforward wooden frames, with even some expression given them by leaving the upper panes unglazed, and in the deep shadow of the eaves.

These two examples suffice to show as well as a thousand, that Queen Anne, as Queen Anne, is a sheer affectation, altogether unworthy the attention of grown men. Messrs. Shaw and Collcutt would give precisely the same kind of new impulse to art by getting out the clothes and wigs of their great-great-grandfathers, and walking down the public streets, as by putting up these buildings along them. If works of millinery were as durable as works of architecture, they might do as much mischief. And yet even a fashion is worth studying for what it tells us about the people who set and the people who follow it; and the Queen Anne fashion has lasted long enough to show that it appeals to some real feeling. It is a fashion of being old-fashioned, which is not the worst of fashions. It shows that people have been revolted by the recklessness of much recent work into a regretful feeling for the times when building was decent, even if it was stupid. That is a feeling which architects would do well to consult, by trying to find out what were the qualities, if there were any apart from mere remoteness, which make the buildings of the eighteenth century impressive, even if the men who did it did not think about what they were doing. Parroting the forms of those buildings is not the way to get back their moderation and respectability. That is the Queen Anne way; but to repeat forms, instead of changing them with the changes of what they express, is the mark of a dead architecture. And for a man who knows better to repeat the blunders of his predecessors who knew no better is a puerile pedantry. Queen Anne may turn out to have done good service in calling the attention of architects to qualities and constructive appliances they have been apt to lose sight of, in their unthinking acceptance of their own several sets of forms. But of the work of its practitioners it may be safely said, that what of it is good is not Queen Anne, and what is Queen Anne is not good; that it has no sort of validity or standing as a style; and that beginning as an attempt to re-establish a mere fashion which had gone irrevocably by, it is likely to end as a masquerade. S.

THE ILLUSTRATIONS.

ST. THOMAS'S CHURCH, HARTFORD, CONN. MR. HENRY M. CONGDON, ARCHITECT.

(111 Broadway, New York.)

THIS church was built in 1872, though not in accordance with the original design here shown, — granite paving blocks having been substituted by the Building Committee, for the brick and Ohio stone in the design, — two bays of nave and aisles were also left for future completion.

INTERIOR. MR. CLINTON DAY, ARCHITECT.

(Oakland, Cal.).

THIS illustration represents a study-table and book-shelves, in oak, with tiles inlaid, and engraved ornament filled with vermilion. Instead of being occupied by drawers, the upper space of shelves is enclosed by flap-risers, which slide in grooves immediately under the top shelf.

THE JOHNS HOPKINS HOSPITAL, BALTIMORE, MD. MR. J. R. NIERNSÉE, ARCHITECT.

(39 North Charles Street, Baltimore, Md.)

IT would be hard to find a more satisfactory and complete refutation of Prof. Huxley's disparaging remark upon architects than comes from the city where that remark was made in the form of the plans for this hospital. We regret that space does not allow us to reproduce from Dr. Billings's report accompanying the plans more of the description of the building, and the discussion of its merits: —

The Johns Hopkins Hospital is to receive the sick poor of the city of Baltimore and its environs, without regard to sex, age, or color. It is intended that there shall be a large, open, central space; that all the buildings shall be constructed of brick; that all the wards shall be in one-story buildings, resting on basements about ten feet high, and connected by a corridor, the top of which shall form a terrace-walk, or veranda, level with the ward-floors; and, lastly, that the south ends of all wards shall be clear of service-rooms, and fully exposed to light and air.

The number and distribution of beds which this plan will accommodate is as follows: —

12 common wards, 24 beds each	288
12 two-bed wards	24
12 one-bed wards	12
2 isolation wards, 20 beds each	40
2 pay wards, 13 beds each	26
To be placed in tents	10
Total number of beds	400

The isolation wards are intended for dangerous and offensive cases; but not for the worst of these, which are to go in tents. This applies to paying as well as to non-paying patients.

In the amphitheatre building the stairs on the west are for the conveyance of cases of injury directly to the operating floor. Where an elevation of but one story is to be attained, less pain is given to the patient by carrying him on a stretcher up a broad, easy flight of stairs than by moving him into and out of a lift. The similar stairs on the east are for students to pass up into the

amphitheatre. This last has two hundred and fifty seats, north and south lights, and a skylight.

With regard to the system of heating and ventilation to be employed in this hospital, no decision has been made; but as it is impossible to judge of the merits of any plan of hospital construction without reference to ventilation, the following remarks, which may indicate possible methods, and the points upon which information is desired, are offered.

It is here supposed that the hospital is to be heated by hot water, at a temperature of less than 209° F., circulating in coils or gangs of cast-iron pipe placed in the basement beneath the rooms to be warmed. Over the surfaces of these coils the fresh air is to pass before it enters the rooms. To furnish the supply of hot water, six boilers are placed in the kitchen building; and their furnace flues empty into an aspirating chimney, ten feet square at the base, and two hundred feet high. Into this chimney empty, also, the smoke-flues of the kitchen furnaces; and at the base the foul-air duct, which passes underneath the floor of the corridor, and receives the foul-air ducts from the several wards. The advantages are, that in winter the waste heat from the furnaces is utilized to produce ventilation; the large aspirating chimney works steadily night and day, and is not liable to get out of order. There are, however, some objections to this method. In the great majority of cases in which it has been applied to numerous detached or to very large buildings, where the ducts are numerous and complicated, the result has not been satisfactory. Under certain conditions of wind and temperature, the draught in the chimney is checked, and may be suspended or even reversed; while the chimney is acting, the use of open windows, fireplaces, and ridge ventilation is almost precluded; and whenever a door is opened into the ward a current of air rushes inward.

In the ward itself the fresh air will be admitted near the sides of the ward, and very near the floor. The best points from which to draw off the air by aspiration are either along the central line of the ceiling, or the central line of the floor. Suppose the aspirating duct to be along the ceiling, and that it is a still, warm day: it will not do to open the windows, for the result will be a direct current from the upper part of the open window to the centre of the ceiling, while the air on the level of the beds will be little changed. If the duct be beneath the floor, with openings along the central line, the result will be better, as the incoming fresh air will then sweep across the beds. Both ducts might be provided, in order that either might be used as circumstances require. If a gentle breeze be blowing, and the windows be opened, all the aspirating openings must be very carefully closed; for the breeze blowing across the mouths of these openings tends to draw the air out of them, and to produce a reverse current in the foul-air ducts. This is one of the special difficulties met with in applying aspiration ducts to a room with opposite windows, which difficulty is not met with in the rooms of a private house or a prison. In the ward, either the aspirating ducts or the windows must be kept closed.

But if we close the aspirating ducts, from whence is the chimney to derive its necessary supply of air? It will not do to say that in warm, breezy days we will not use the chimney at all. The kitchen fire, and the furnace of the steam-engine which works the laundry machinery, and the pumps, must be kept going; and for this purpose the chimney must have the necessary draught; or these furnaces must have separate flues. Again, the use of open fireplaces in the wards is not compatible with an aspirating shaft, unless the fireplace flues are carried into the aspirating flues, which must then be made fireproof, at an increased expense. By this central aspirating plan the principal benefits of the one-story plan appear to be given up, and we connect the whole of the wards, which have been so carefully separated, by a series of ducts about three feet square, the only security against regurgitation from which is the constant application of a powerful force at the central chimney.

If the great single aspirating shaft be given up, there are several plans of heating and ventilation which merit consideration. The heating boilers may be separated. So far as heating only is concerned, this arrangement is better than keeping the boilers together, since it insures a more direct and rapid circulation of the heated water in the buildings on the south side. If this be done, we may undertake to rely for ventilation on the windows and openings in the ridge. This will do very well for at least ten months in the year, especially with the aid of fireplaces in the wards; but there will be certain days when it will not be satisfactory.

With regard to fireplaces a central position is much better than the corners. In one-story wards there is no difficulty in placing double fireplaces in the centre of the ward, or in removing them at any time. Such fireplaces may be made of Russia iron, like those which have been used in army hospitals, and which practical trial proved to give excessive ventilation with insufficient heat — just what is wanted in these wards whose main supply of heat comes from another source, — or they may be of porcelain tiles, like German stoves. In this connection attention is invited to the central fireplace arrangement in Mr. Niernsée's modification of the square ward. This is perhaps the most satisfactory way of disposing of fireplaces, and affords facilities for the use of independent central aspiration for each ward throughout the year, which merit careful consideration.

Another way of effecting heating and ventilation is to give to each ward its own hot water boiler, placed in the basement of the service building. The only argument in its favor, which is however a very strong one, is that each ward would thus be made absolutely independent.

With either of the methods of heating referred to, use may be made of a fan, and this fan may be used either for aspiration or impulsion. If used for aspiration, precisely the same ducts would be used as for the great aspirating chimney; if for impulsion, there would be one right angle less in the duct for each ward. With the fan an extra relay of firemen must be employed for night work; and this with repairs, etc., would probably bring the cost of working it nearly to that of the chimney, if it is to be constantly employed. If a fan be used as a means of impulsion, it is probable that it would not be necessary to run it over four months in the year. During mild weather, when the air is in motion, nothing can equal opposite open windows and ridge ventilation. One essential point to all these systems is to have the flues large and numerous, and especially the flues for ingress of fresh air. Air moving at the rate of between one and two feet per second creates no perceptible current; and if we give a clear square foot of opening for fresh air to each bed we can supply our average of one foot per second per man without any precautions as to draughts. I speak of one foot per second as the "average;" for the isolation wards, means should be supplied to quadruple this amount.

Data as to cost of these methods are not available at present; and I should be very glad to obtain positive information as to the effects produced by aspirating chimneys or by fans of about the size of those required for this hospital. In this case opinions are of little value. The most eminent engineers differ widely in their estimates as to the relative merits of the fan and the chimney; and it is mere waste of time to pay attention to the greater part of what is said or written on this subject. What we want to know is, how much coal is burned per hour, how much air does it move, and what are the sizes and lengths of, and number of angles in, the ducts? Half an hour's careful observation with the anemometer and thermometer, with an air analysis, if possible, and an accurate record of the results, are of more value than any number of statements that the building is ventilated well or ill.

CORRESPONDENCE.

BURNING OF THE BROOKLYN THEATRE.

NEW YORK.

ON the evening of Tuesday, Dec. 5, the Brooklyn Theatre, situated on Washington Street, was occupied by some thousand spectators gathered to witness a performance of the "Two Orphans." All progressed in usual course until at the opening of the last act, when the stage is occupied by the covered boat-house scene, a "fly" overhead was in some way wafted against a border light, and ignited. It was noted at once by the stage employees, who attempted to extinguish it by striking with a stick at the then tiny bit of blazing canvas. A burning shred fell down, not to the stage below, but to the canvas roof of the scene then on. From that time the action was terribly rapid. The stage hangings were soon a mass of flame, while actors and audience fled in panic. A majority escaped, but three hundred or more human lives were sacrificed in the mad rush for safety. The theatre proper was about 70 x 125 feet in plan, with a parquet and balcony, and two galleries. The entrance was by way of a long lobby opening on Washington Street, giving to the general ground plan the form of a letter L, the enclosed angle being occupied by a hotel and restaurant. The building had three free sides. Upon Johnson Street the stage entrances only opened, to Flood's Alley there were means of exit from the lower parts of the house, while to Washington Street the general exit was effected; the parquet and dress-circle opened into one general lobby, while the upper-

most gallery people went up a flight of stairs, then along a landing at right angles, and up a second flight to the gallery level. Upon the construction of these stairs the principal interest of the whole event turns, for it was upon this staircase that so many met a dreadful fate.

The flames seem to have taken a set out into the auditorium along the ceiling, which was constructed of thin boards covered with painted canvas, and where the flames seem to have found ready food in the paint-covered surface. From the centre of the ceiling a dome arose, and up this the fire rushed. The smoke from the burning paint-work was most suffocating, and this attendent element must be remembered. When the stage doors were thrown open, the wind blowing from the Johnson-street side created a draught through the building, and drew flames after the fleeing audience. From the parquet and main floor of the house the people poured out into the lobby and along the passage to Washington Street. From the dress-circle, too, the descent was slight, and the escape comparatively easy; and few if any lives were sacrificed here, the departure of the crowds being hastened by the opening of a fire-escape door to Flood's Alley. The wholesale slaughter came in the gallery staircase, by which passage the four hundred occupants of the gallery could alone escape. The gallery stairs lay between plain sheer walls without balusters or rail, making, as it were, a funnel down which the people were to pour themselves. The first few, with a clear way before them, made good their passage to the bottom; but when the crush became intense, the progress of the mass was not so ready. Some fell upon the first landing; and in a twinkling the passage-way was choked. Those on the street without describe how for a few moments the gallery people came rushing out, and then ceased. This was the time of the blockade. There was upon the staircase to the gallery a door at the first landing above the street, leading to the dress-circle tier, intended to give those in the lower part of the house an additional means of escape, by turning them out to take advantage of the gallery exit. This door, however, was not opened, and hence may be considered as not existing. Its opening would have availed but little, if any, to the gallery prisoners, since below the crush and stoppage the stairs were open, and are yet standing. The great fault in the construction of the play-house was that the gallery was provided with but one exit, and this was a double flight of stairs with a double turn, and not broad enough to permit the rapid descent of an excited crowd. The conditions were in every way favorable for a great loss of life. There was first the blockade, then the smoke with its stifling effects, and then, to cap the misfortunes, the gas throughout the theatre was cut off. On one side the lobby was the boundary wall of the theatre, while on the other was also a slighter brick wall carried up to the lower side of the dress-circle and from which the columns supporting the gallery rose yet higher. In the ruins these two walls make in the cellar an oblong pit: into this the stairs fell; and here were found heaped the charred bodies of the majority of the victims. On the stairs they were smothered, but comparatively unburned. The flames cut off the exit by means of the regular stage door; and but for a sub-passage running from the apartments below the stage underneath the parquet to the Washington-street lobby, many of the actors would have lost their lives.

The investigation of the fire-marshal into the origin of the fire has called out a great amount of testimony which would seem to show that the care of the theatre was not over-good. The majority of those employed about the building knew of no fire-extinguishing appliances. The janitor remembered an old hose somewhere in the upper lofts; but it was considered useless. The property-man testified there were no appliances for extinguishing fires about the place. Thomas R. Jackson, from whose designs the building was erected in 1871, an old and experienced member of the architect's profession, — he was the architect of Wallack's Theatre, New York, of the present Academy of Music in this city, of Tammany Hall here, and a number of theatres and playhouses in other parts of the country, — testified that "the Brooklyn Theatre was erected in 1871, and was about 70 by 127 feet in dimensions. It had a parquet and balcony, and two galleries. There was one twelve-inch partition-wall of brick, one story high; this was the lobby wall, and partly supported the gallery: that was the usual thickness of such a wall. Those were the only walls. On the east side of the theatre, fronting Flood's Alley, there were two windows at the flies, and, I think, two on each gallery. The main entrance, from Washington Street to the parquet, was about twenty feet wide; this was the vestibule. The lobby entrance to the parquet from the vestibule was sixteen feet wide. There was one fourfold door eight feet wide, and one twofold door six feet wide, leading from the lobby into the parquet. There were also three doors from the parquet to Flood's Alley, a narrow street on the east side of the theatre. Those doors were about six feet wide, hung so as to swing outward, and secured with bolts only, so that they could be opened easily from the inside in case of an emergency. There was a stage entrance door from Johnson Street, five feet wide; and also a large scene-door, perhaps eight feet wide. The green-room was in the basement, under the stage; and there was a door from the green-room out to the area-way, and steps from that to the sidewalk on Johnson Street, to be used in case of necessity. There was a private passage-way from the stage underneath the parquet, to the treasurer's office; there was also a private entrance from Washington Street to the apartments up stairs. The stairs from the dress-circle were from the lobby of the parquet, and were about ten feet wide. There was also a stairway from the dress-circle, leading out into Flood's Alley. There was an outlet from the dress-circle to the gallery-stairs; and persons in the gallery could come down this way, go through the dress-circle, and out on Flood's Alley. There was a separate gallery stairway from the vestibule on Washington Street, about seven or eight feet wide all the way up. There was a pair of doors there opening outward, leading to the gallery. All the doors that I put in the building opened outward. The vestibule to the stage door I did not put up. There were no means of exit from the gallery to Flood's Alley except through the dress-circle. There were no fire-escapes there from the gallery. I call the exit from the dress-circle a fire-escape. There were no others that I know of in any part of the building. I am not familiar with the fire-escape law in Brooklyn; I do not even now think that fire-escapes from the gallery were necessary on Flood's Alley. People going to the theatre get accustomed to the regular way of exit, and would look for no other; and, if they did find a fire-escape, they would overcrowd it, and probably cause a great loss of life. The Brooklyn Theatre was as well provided with means of exit as any theatre that I know of. When the theatre was first built, there was a fire-hydrant and a hose on the stage for the suppression of fire. I always put in such apparatus. The hose was a regular fire-hose. I do not know what became of it. There were two platforms in the gallery stairs, and only two, to the best of my recollection. This made two bends at right angles. The beams under this stairway were extra strong; the girders were twelve by twelve inches; the beams, some four by twelve inches, and some three by twelve inches. Some were of Georgia pine, and some of white pine. They were built in and anchored in the walls. I do not think these stairs could have become broken down from any number of persons in the gallery, unless they were first injured by fire."

Mr. George L Morse, who had been engaged professionally upon the building in alterations, testified that he was an architect with a seventeen-years practice in Brooklyn, and "should say after examination, that the building was well constructed beyond question, so far as stability is concerned. I reconstructed it a year ago: I am satisfied it was safe from fire. As to the means of egress, the minimum width of passage-way from the parquet and dress-circle, at the end of the building, was six feet eight inches; the passage from the dress-circle was seven feet, and from the family-circle, or first gallery, six feet. According to the plans there were 400 sittings in the balcony, and 250 in the orchestra chairs, making 650 on this level; now, if you deduct the seven feet of stairway from the dress-circle, there will be left nine feet eight inches, which it would be proper to allow for the exit of the 650 sittings on this level, so that we have nine feet eight inches minimum width of passage-way for the 650 sittings on the first level, seven feet for the 450 sittings in the dress-circle, and six feet for the 350 sittings of the family-circle or gallery. My opinion is that an audience of 1,450 people, if they were there, could easily find their way out under ordinary circumstances, if there were no jam or obstruction, in from two and a half to three minutes; the stairs to the gallery were entirely separate from the passages to the other parts of the house, with the exception of a doorway to the dress-circle on the first landing by the ticket-office for the upper tier; I am not able to say whether it was open on this occasion or not.

"*Q.* Was it practicable, as the building was situated, to have had a fire-escape from the gallery to Flood's Alley on the outside? *A.* It would have been possible to have constructed a fire-escape there, but it would have been worse than useless in such a jam. An iron staircase outside would have been an effectual relief, but this would have been an encroachment on a public thoroughfare.

"*Q.* Was this building as well provided with means of exit as

other public buildings, especially theatres? *A.* In my opinion the means of egress were decidedly better than in the average of public buildings. The staircase leading to the upper gallery was in two straight runs; the size of the landing between the two runs was fourteen feet by six feet eight inches. The first flight, which is not entirely destroyed, was very substantially constructed, and would not give way under any load of people that could get on it; it is fair to assume that the other flight was constructed in the same manner. It is very improbable that those stairs gave way until they were burned away.

"*Q.* Was there any means of escape for those in the gallery by means of the roof? *A.* I don't think there was; the roof of the theatre was a steep double pitch roof, upon which the crowd could not have stood."

The loss on building and appointments will reach $120,000; insured for some $40,000. It was built by days' works, and cost over $200,000, the owners and builders being the Brooklyn Building Association, an offshoot of the old "Brooklyn Ring" of politicians and their friends. For a time it was under control of Mrs. Conway, but latterly has been controlled by Messrs. Shook and Palmer of the Union Square Theatre, New York. An examination showed that any idea of using Flood's Alley as a means of escape from the upper gallery would have been checked by the narrowness of the passage.

HOW TO LAY DRAINS IN LEVEL GROUND.

STAMFORD, CONN.

TO THE EDITOR OF THE AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — I have followed with much interest the series of articles you have published on "The Sanitary Condition of Country Houses," the subject being one to which I have given considerable attention.

The fourth article (in your issue of 18th ult.) approaches, but does not quite reach, one of the points involved, which is of so much importance, that I venture to ask for its consideration in a subsequent paper. The question I refer to is that of the disposition of sewage from a country house, where there is no town drainage available, and *where the grounds surrounding the house are level* (which, by the way, is the usual condition in country towns). To simplify the consideration, let it be supposed that there is a street water-supply, so that contamination of springs is not to be guarded against; that the house is provided with water-closets, sinks, etc.; that the waste-pipes are all connected with a four-inch iron soil-pipe, and that the latter passes through the basement wall, from three to four feet below ground, to avoid frost. Now, given the above conditions, how far must the sewage be carried from the house, and how shall it then be disposed of?

Obviously the character of the soil is an important element; and I would suppose, therefore, the two most ordinary cases, (1) where the soil is of gravel, porous; and (2) where it consists of clay, not porous. It should be remembered, also, that the soil-pipe necessarily leaves the house at a depth which precludes the subsoil irrigation system of Mr. Moule.

The conditions I have supposed are such as will apply to the majority of residences in small towns and suburban villages, as well as to many country houses; and you can do no more useful service than by indicating the proper treatment of this problem, which, perhaps on account of its difficulty, is one but very lightly touched upon in most treatises on sanitary engineering.

Respectfully yours,

HENRY R. TOWNE.

NOTES AND CLIPPINGS.

THE CHICAGO CUSTOM-HOUSE. — Work on the Chicago Custom-House itself has nearly stopped; but as there are about $198,000 of the last appropriation still unexpended, stone-dressing will probably be continued through the winter months. For those who are partial to statistics it may be stated, that, since the 1st of January, 1875, when the work was first commenced, over 4,500,000 bricks have been laid, more than 140,000 cubic feet of stone have been set, and the total value of the iron work in the building at present is $385,000.

GAS-EXPLOSION. — On Sunday, Dec. 10, a gas-explosion took place in a house on Beacon Street, Boston, the only effect of which was to destroy all the window-glass in that and adjoining houses.

PRAYER-BOOKS AND HYGIENE. — A French writer on "The Mortality of Young Children" suggests, as the best means of bringing mothers to a proper knowledge of the laws of hygiene, that its elementary laws should be printed at the end of prayer-books, missals, and religious books generally.

A BUILDING BLOWN DOWN. — At five o'clock on the morning of Dec. 9, the high north-west gale which blew with the force of a hurricane across the North River threw down the tower of the elevator of the Hudson River and New York Central Railroad, at the foot of West Sixtieth Street, New York. A watchman employed on the premises was instantly killed.

BROOKLYN CLAY-BEDS. — As the city of Paris rests upon a bed of gypsum, so within the city of Brooklyn there are deposits of clay practically exhaustless, and near the spot where population is most rapidly extending. A valuable clay-bed, twenty feet in depth and eleven acres in superficial area, exists on Yates and Putnam Avenues. Within the past summer the material for sixty houses has been taken from a single excavation, at the rate of sixty thousand bricks a day; and the capacity of the mine is estimated at 10,000,000 per annum.

VERDE ANTIQUE MARBLE. — A valuable deposit of verde antique marble has just been discovered in Long Swamp Township, Penn., within half a mile of Topton, on the East Pennsylvania Railroad. The marble is susceptible of a high polish, and is found associated with other minerals, such as dark green and variegated felspar, red oxide of iron, hematite iron ore, outcroppings of black oxide of iron, and a large deposit of fine fire sand.

THE DANGER OF LAMPBLACK. — Within two years there have been three shoe-shops lost in Massachusetts from lampblack. A hand damp with perspiration, a drop of water, a bit of grease, or a sprinkle of oil, will create the combustion that will start lampblack aglow like charcoal. In lampblack factories, while precaution is taken to prevent fires, a rainy day or a sharp frosty day will start a dampness upon the inside of a window-pane; and the flying particles of dust lighting upon this create the spark which, communicating to the pile, sends a glow of fire with wonderful rapidity through the galleries of the shop. In cleaning up the smoke-galleries, if the men let a drop of perspiration fall into a pile, they instantly scoop up the black in and about where it lodges, and take it out of the house. — *Boston Commercial Bulletin.*

IMMENSE BUILDING BLOCKS. — In the opening address before the Institution of Engineers and Shipbuilders in Scotland, it was stated, that as natural stones of sufficient size to resist upheaval by wave-action could not be obtained, engineers had been obliged to make use of concrete blocks. The first who adopted the use of concrete blocks of great size was Mr. Stoney of Dublin, "who built, lifted, and set in place, blocks of three hundred and fifty tons weight in the construction of the river-wall in Dublin Bay." Blocks weighing forty or sixty tons are now being used in constructing the Tyne piers, which are exposed to the German Ocean. And at Jersey Harbor, where the power of the tide is unsurpassed, Mr. Bell is using blocks of one hundred tons weight, "which are carried out to sea suspended under the bottom of a large welled barge, and set in their places, the bottom having been previously prepared with concrete in bags containing ten to twenty tons in each, lowered through the wells of the barges."

AN ACOUSTIC PUZZLE. — A partition wall which is formed of uprights 4″ x 4″, dovetailed into the head and sill (which are fitted tightly to ceiling and floor respectively), and covered with inch boarding tongued and grooved, transmits sound so freely that conversation can be easily heard through it; and this though the space between the boardings is filled with sawdust, and the walls on either side covered with canvas and paper varnished. There are double doors in the partition, — one an ordinary wooden door, the other a 1¼″ solid door covered with baize.

THE FUMES OF BRANDY. — At Cognac strangers are struck by the carbonized state of the roofs and walls of all the more ancient houses, the grimy appearance of which they at once ascribe to the smoke from surrounding distilleries. There are, however, no distilleries at Cognac. These blackened walls are simply due to the chemical action of the vapors arising from the eau-de-vie stored in the vast *entrepôts* of the brandy capital.

DICTIONARY OF ARCHITECTURE. — The third volume of the *Dictionnaire Raisonné d'Architecture et des Sciences qui s'y rattachent*, by M. Ernest Bosc, published by Firmin, Didot, et Cie., gives, besides a short treatise on heraldry, a history of Byzantine architecture, illustrated with a chromo-lithograph which gives an idea of the coloring produced by the mosaic so freely used.

A SHOWER OF VOLCANIC DUST. — On March 30, 1875, a shower of volcanic dust fell over large portions of Sweden and Norway, covering the ground with ashes to the depth of a quarter of an inch. In the preceding December, volcanic eruptions began from numerous craters in the interior of Iceland; and on the 29th of March a heavy shower of ashes fell upon the island, covering the pastures in some places with six inches of ashes. As the wind was favorable to such a phenomenon, it is possible that the ashes that fell in Norway and Sweden belonged to the same shower, and in this case must have been carried, in less than twenty-four hours, a distance of more than seven hundred miles.

SPANISH HOSPITALS. — The proposition to erect hospitals of wood on the American plan for the use of soldiers sick with small-pox has been approved by the Spanish Government, and the sum of 88,400 pesetas (about $49,000) has been appropriated for that purpose.

MORE FOOLISH THAN ECCENTRIC. — An eccentric gentleman has erected recently in the poorhouse cemetery at Richmond, Va., a handsome marble shaft bearing his name. Blank places are left for his age and day of death. The act is evidence that he is conscious whitherwards his folly is leading him.